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10/067,516

02/04/2002

Mark A. Handschy

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09/21/2004

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EXAMINER

THOMPSON, TIMOTHY J

ART UNIT

PAPER NUMBER

2873

DATE MAILED: 09/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/067,516

Applicant(s)

HANDSCHY ET AL.

Examiner

Timothy J Thompson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 10-22, 26-28 and 31-43 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 15 and 36 is/are allowed.
- 6) ☒ Claim(s) 10-13, 16, 17, 19-22, 26, 31-35 and 37-42 is/are rejected.
- 7) ☒ Claim(s) 14, 27, 28 and 43 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 February 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_.

## **DETAILED ACTION**

### ***Claim Objections***

Claim 43 is objected to because of the following informalities: Claim 43 depends from a canceled claim. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 10, 11, 13, 16, 17, 19, 20, 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ooi et al.(U.S. Patent No. 5,648,860) in view of Wakita(U.S. Patent Pub No. 5,422,747).

Regarding claim 10, Ooi et al. discloses a source of light(fig 22, LS) located proximate to the micro display; a microdisplay located proximate to the light source(fig 22, E2); a reflector located above the support surface in position to reflect the light from the source of light to eventually illuminate the microdisplay(fig 22, 22). Ooi et al. does not specifically disclose a support surface. However, Hayase et al. discloses a support surface for supporting an LCD matrix(fig 1, 15). It would have been obvious to one skilled in the art at the time of the invention to use a support surface for supporting the LCD matrix as shown by Wakita, in the display device of Ooi et al., since as shown by

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Wakita, support surfaces are commonly used with an LCD matrix so as to maintain the matrix in the desired position relative to each other.

Regarding claim 11, Ooi et al. discloses wherein the reflector is substantially planar(fig 22, the reflector directly above the lens LC).

Regarding claim 13, Ooi et al. discloses the reflector is a beam splitter(fig 22, 22).

Regarding claim 16, Ooi et al. discloses the microdisplay is a reflective spatial light modulator(fig 26).

Regarding claim 17, Ooi et al. discloses elements positioned in a light path above the microdisplay(fig 22, L4), wherein the microdisplay is a reflective microdisplay(fig 26), wherein the optical elements are receptive of light reflected from the microdisplay, the optical elements directing the reflected light for viewing(fig 22), and further wherein the reflector(fig 22, 22) is positioned in the light path between the microdisplay and the optical elements(fig 22).

Regarding claim 19, Ooi et al. discloses the microdisplay is a reflective liquid crystal spatial light modulator(fig 26).

Regarding claim 20, Ooi et al. discloses the spatial light modulator is pixilated(fig 26).

Regarding claim 22, Ooi et al. discloses the beam splitter(fig 22, 22) is optically disposed between both the light source(fig 22, LS) and the spatial light modulator(fig 22, E2) and between the spatial light modulator and a source imaging area, the beam

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splitter directing light from the light source to the spatial light modulator and from the spatial light modulator to the source imaging area(fig 22).

Claims 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ooi et al.(U.S. Patent No. 5,648,860) in view of Wakita(U.S. Patent Pub No. 5,422,747) as applied to claim 10 above, and further in view of Saito et al.(U.S. Patent No. 4,784,791).

Regarding claim 21, a modified Ooi et al., as detailed in claim rejection 10 above does not specifically disclose the spatial light modulator uses a ferroelectric liquid crystal. However, Saito et al. discloses a ferroelectric liquid crystal stating it has an improved response rate (col 1). It would have been obvious to one skilled in the art at the time of the invention to use a ferroelectric liquid crystal as shown by Saito et al., in the display device of Ooi et al., since as shown by Saito et al., a ferroelectric liquid crystal is commonly used in display devices for there improved response time.

Claims 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ooi et al.(U.S. Patent No. 5,648,860) as applied to claim 32 above, and further in view of Saito et al.(U.S. Patent No. 4,784,791).

Regarding claim 34, Ooi et al., as detailed in claim rejection 32 above does not specifically disclose the spatial light modulator uses a ferroelectric liquid crystal. However, Saito et al. discloses a ferroelectric liquid crystal stating it has an improved response rate (col 1). It would have been obvious to one skilled in the art at the time of the invention to use a ferroelectric liquid crystal as shown by Saito et al., in the display

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device of Ooi et al., since as shown by Saito et al., a ferroelectric liquid crystal is commonly used in display devices for there improved response time.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 26, 31, 32, 33, 35, 37-40, 42 rejected under 35 U.S.C. 102(b) as being anticipated by Ooi et al.(U.S. Patent No. 5,648,860).

Regarding claim 26, Ooi et al. discloses a microdisplay that lies substantially in a plane(fig 22, E2); a source of light located proximate to the plane(fig 22, LS), the source being oriented to direct light up and away from the plane(fig 22); and an optical element located above the plane in position to direct the light from the source of light toward the microdisplay(fig 22, 22), the optical element being substantially further away from the microdisplay than is the source of light, wherein the optical element includes a reflector, wherein the reflector is a beam splitter(col 16, lines 45-52).

Regarding claim 31, Ooi et al. discloses a microdisplay that lies substantially in a plane(fig 22, E2); a source of light located proximate to the plane, the source being

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oriented to direct light up and away from the plane(fig 22, LS); and an optical element located above the plane in position to direct the light from the source of light toward the microdisplay(fig 22, the reflector directly above the lens LC), the optical element being substantially further away from the microdisplay than is the source of light; wherein each of the light source and the microdisplay have a primary optical axis, and further wherein these optical axes intersect with one another.

Regarding claim 32, Ooi et al. discloses a microdisplay that lies substantially in a plane(fig 22, E2); a source of light located proximate to the plane, the source being oriented to direct light up and away from the plane(fig 22, LS); and an optical element located above the plane in position to direct the light from the source of light toward the microdisplay(fig 22, the reflector directly above the lens LC), the optical element being substantially further away from the microdisplay than is the source of light(fig 22); wherein the microdisplay is a reflective liquid crystal spatial light modulator(col 4, lines 37-46).

Regarding claim 33, Ooi et al. discloses the spatial light modulator is pixilated(fig 26).

Regarding claim 35, Ooi et al. discloses the beam splitter(fig 22, 22) is optically disposed between both the light source(fig 22, LS) and the spatial light modulator(fig 22, E2) and between the spatial light modulator and a source imaging area, the beam splitter directing light from the light source to the spatial light modulator and from the spatial light modulator to the source imaging area(fig 22).

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Regarding claim 37-39, Ooi et al. discloses a microdisplay that lies substantially in a plane(fig 22, E2); a source of light located proximate to the plane, the source being oriented to direct light up and away from the plane(fig 22, LS); and an optical element located above the plane in position to direct the light from the source of light toward the microdisplay(fig 22, the reflector directly above the lens LC), the optical element being substantially further away from the microdisplay than is the source of light(fig 22).

Regarding claim 40, Ooi et al. discloses the optical element includes a reflector(the reflector directly above the lens LC(fig 22).

Regarding claim 42, Ooi et al. discloses the microdisplay is a reflective microdisplay(fig 26).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 12 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ooi et al.(U.S. Patent No. 5,648,860) as applied to claims 10 and 24 above, and further in view of Aho et al.(U.S. Patent No. 4,874,228).

Regarding claim 12, 41, Huang et al. does not specifically disclose the reflector is curved. However, Aho et al. discloses using a curved reflector(fig 7, 90) stating this



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provides for a uniform intensity reflected light(col 5, lines 25-30). It would have been obvious to one skilled in the art at the time of the invention to use a curved reflector, as shown by Aho et al., in the display of Ooi et al., since as shown by Aho et al. using a curved reflector is commonly done so as to provide a uniform intensity of reflected light.

***Allowable Subject Matter***

Claims 14, 18, 27, 28, are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. With the allowable features being the beam splitter is a polarizing or holographic beam splitter.

Claims 15, 36 are allowed.

The following is an examiner's statement of reasons for allowance: The prior art taken either singularity or in combination fails to anticipate or fairly suggest the limitations of the independent claim, in such a manner that a rejection under 35 U.S.C. 102 or 103 would be proper. The prior art fails to teach a combination of all the claimed features as presented in independent claims 15, 36, with the allowable features being; the beam splitter is a polarizing or holographic beam splitter; the source light located within a distance of the microdisplay being less than the lateral extent of the generated image on the micro display(claim 36). Therefore claims 15 and 36 are allowed.

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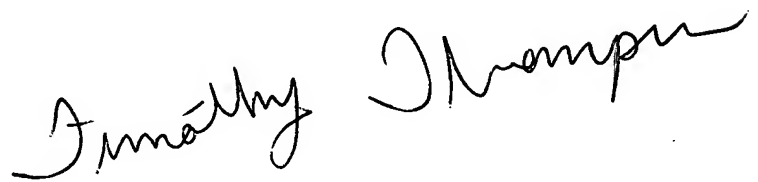
Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy J. Thompson whose telephone number is (571) 272-2342. If the examiner can not be reached his supervisor, Georgia Epps, can be reached on (571) 272-2328.

T.J.T.

9/16/04



**TIMOTHY THOMPSON  
PRIMARY EXAMINER**